Remarks

Claim Objections

Claim 11 has been amended to specifically distinguish the drain that is contacted from the floating drain (which, by definition, is not contacted) by calling the drain that is contacted, the "drain contact region". In the specification the drain contact region is referred to as the n+ drain region 316 when referring to Figure 3 (page 6, line2) and as the drain contact region 500 when referring to Figure 5 (page 6, line 24). In every embodiment though, the floating drain is clearly distinguished and the specification makes it clear that the n+ drain region or drain contact region that is in issue for purposes of the invention is the region that has a contact – not the floating drain.

Claims 12 and 16 have been amended accordingly to comply with the change in wording.

Claim Rejections - 35 USC 102

Claims 17, 5, 7 were rejected over Figure 2 of the acknowledged prior art (APA).

It is respectfully submitted that Figure 2 of the present application (which, presumably is the Figure 2 referred to as the APA) shows a standard LVTSCR known in the art.

The LVTSCR structure:

The LVTSCR is a well-known structure that includes an anode 120 and a cathode 126. The structure includes a NMOS device defined by the floating drain 230 (which is sometimes simply referred to as the n+ drain or drain, and is referred to here as floating drain to emphasize the fact that it does not have a drain contact), the gate 236 and the source 122. In addition it defines a npn BJT (by virtue of the n+ source 122, p-type material 110 and n-well 112) and a pnp BJT by virtue of the p+ emitter region 116, n-well 112 and p-type material 110.

Terminology:

The terms drain 230 and emitter 116 are used due to the nature of the devices that they define. Furthermore, since the n+ region 114 is formed in the same n-well as the floating drain 230, it is often referred to as a n+ drain or n+drain contact or as n+ contacted drain since it forms a drain contact for the floating drain 230. Thus these terms are used for ease of understanding but could simply be referred to as n+ regions or p+ regions.

The structure of a SCR (which does not include a gate and floating drain) is shown in Figure 1 and the LVTSCR (which includes a gate and floating drain -see page 3, lines 25-30) is shown in Figure 2 of the application and both are described in detail in the Background of the Invention, pages 1-4.

It is therefore, respectfully, submitted that **the region 230 cannot be drain contact region, simply because it does not have a contact. It is clearly a floating drain. In contrast, n+ region 114 does have a contact and therefore constitutes the drain contact or contacted drain of the LVTSCR.**

Thus the APA Figure 2 simply shows a standard LVTSCR and does not show at least part of the drain contact region between p+ emitter 116 and gate 236. The only thing that is shown between the emitter 116 and gate 236 is a field oxide region (FOX) and a **floating** drain 230, but no drain contact region. The only drain contact region shown is n+ region 114. Thus the APA does not show a critical feature of the invention and does not anticipate claim 17.

Similarly, claim 5 refers to the drain contact region being split into at least one first and one second drain contact region. Thus there have to be at leas two drain contact regions. However, Figure 2 of the APA only has one drain contact region - n+ region 114.

Similarly, claim 7 requires multiple emitters outside at least part of the drain contact region. In other words, at least part of the drain contact region has to be between the gate and the emitters. However, the APA does not show this - it shows only the drain contact region 114 outside the emitter116.

Claim Rejections - 35 USC 103

Claims 11-12, 14-15, 18 were rejected under 35 USC 103 over the APA and Wei.

As mentioned above, the APA does not show an emitter 116 located so that at least part of the drain is located between the gate and the emitter. Claim 11 discloses a floating drain and a drain. Thus it is clear that the drain refers to the contacted drain (or drain contact region) 114. However, to avoid argument about this point, claim 11 has been amended to specifically refer to

the drain as a drain contact region.

Wei does not add anything since figure 3 of Wei shows a LVRSCR structure that differs from the typical structure shown in Figure 2 of the APA, by the fact that it has deeper regions 72, 102, 82, as discussed in column 7, lines 35-45).

In fact, it bears noting, that contrary to the statement in the Office Action, Figure 2 of the APA does disclose a floating drain (region 230).

However neither reference has contacted drain regions between emitter and base.

Thus claims 12, 14-15, which depend from claim 11, also include features that are neither shown nor suggested in the APA or Wei.

Similarly, claim 18 depends from claim 11 and is therefore also not invalid over the APA and Wei. (As pointed out above, the APA does include a floating drain, but this is not the distinguishing feature beteen the present invention and the prior art references. The distinction lies in having a contacted drain region lying between the emitter and the gate).

Claim 16 also depends from claim 11 and is therefore distinguishable over the APA and Wei. Voldman also does not disclose a contacted drain region between an emitter and a gate, and therefore also does not help in showing obviousness. In fact, Voldman deals with an entirely different structure - it does not include any of the features of the LVTSCR discussed above.

Since none of the prior art references includes an emitter located so that at least part of the drain contact region is located between the gate and the emitter, it is therefore, respectfully submitted that all of the claims are in a position for allowance. Early allowance is therefore respectfully requested.

Respectfully Submitted,

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